

share bus 250. Micro-controllers 220A-C can read the voltage on the common share bus 250 and trigger converters 210A-C to adjust the output current level according to the magnitude of the common share bus voltage and ultimately balancing the current delivery across converters 210A-C.

[0038] In one embodiment, each of the micro-controllers 220A-C are configured to receive a control signal from MC 110 via communication bus 134 designating one of the PSUs (i.e. PSU 130A) to be a master power supply and the other PSUs (i.e. PSUs 130B-C) to be slave PSUs. As one example, based on the received control signals, micro-controller 220A can turn on MOSFET 240A and micro-controllers 220B-C can turn off MOSFETs 240B-C such that PSU 130A is the master PSU that sets the voltage on the common share bus 250. Because MOSFETs 240B-C are turned off, PSUs 130B-C are slave PSUs and cannot overtake the voltage level on common share bus 250. PSUs 130B-C read the voltage on the common share bus 250 and adjust their output current based on the voltage level on common share bus 250.

[0039] Referring to FIG. 3, further details of the PSUs and specifically PSU 130A are illustrated. PSU 130A includes converter 210 having an input/earth ground terminal 310 and an AC/DC input power terminal 312. Converter 210 further has an output ground terminal 314 and a +Vout terminal 316. +Vout terminal 316 can supply a controlled current to IHS 100. Converter 210 is coupled to micro-controller 220A by an internal bus 320. Micro-controller 220A includes an analog to digital (A/D) converter 340, a digital to analog (D/A) converter 342 and an input/output (I/O) module 346. A/D converter 340 is coupled to +Vout terminal 316 by a circuit line 322 allowing micro-controller 220A to sense and sample the output voltage and current of converter 210A. For simplicity of illustration, the current sense element used by circuit line 322 is implied. Micro-controller 220A is further coupled to micro-controller memory 330. In one embodiment, micro-controller memory 330 can be a non-volatile or flash memory device.

[0040] PR 230A comprises an operational amplifier (OPAMP) 350, a diode 352, and a resistor 356. OPAMP 350 has a positive input terminal 360, a negative input terminal 362 and an output terminal 364. Operational amplifier 350 and associated feedback components are specific to this implementation, but alternative methods can be used to achieve similar functionality. A resistor 358 is coupled between D/A converter 342 and positive input terminal 360. Diode 352 has an anode coupled to output terminal 364 and a cathode coupled to node 357. Resistor 356 is coupled between negative input terminal 362 and node 357. MOSFET 240A has a gate 372, a source 370 and a drain 374. Gate 372 is coupled to I/O module 346. Source 370 is coupled to node 357 and drain 374 is coupled to common share bus 250. Diode 376 has an anode coupled to source 370 and a cathode coupled to drain 374 and to the common share bus 250. A circuit line 380 is coupled between common share bus 250 and A/D 340, allowing micro-controller 220A to sense and sample the voltage on common share bus 250. In one embodiment, MOSFET 240A can be replaced by a transistor having a base coupled to MC 220A via I/O module 346, a collector coupled to PR 230A, and an emitter coupled to common share bus 250.

[0041] During operation, if micro-controller 220A receives a control signal from MC 110 designating PSU 130A as a master PSU, micro-controller 220A turns on MOSFET 240 via I/O module 346 and gate 372 resulting in

an almost zero voltage drop across MOSFET 240 and diode 376. PR 230A provides an output voltage that effectively is the voltage on the common share bus 250. If micro-controller 220A receives a control signal from MC 110 designating PSU 130A as a slave PSU, micro-controller 220A turns off MOSFET 240 via I/O module 346 and gate 372. In this mode, the PSU can only drive the current share bus 250 through the body diode (internal to MOSFET 240) or diode 376 and is prohibited from driving the common share bus 250 due to the additional diode voltage drop (e.g. 0.7V) below the voltage on the common share bus.

[0042] FIG. 4 illustrates details of another embodiment of a power subsystem 425 operating within IHS 100 to implement selecting a master PSU from among PSUs 402A-C. Referring to FIG. 4, power subsystem 425 comprises PSU 402A, 402B, and 402C. PSU 402A includes a converter 210A, micro-controller 220A, precision rectifier (PR) 230A, metal oxide semiconductor field effect transistor (MOSFET) 240A and control circuit (CC) 410A. The output of MOSFET 240A is coupled to a common share bus 250. Converter 210A is a circuit such as an AC to DC or DC to DC converter that converts one voltage type and/or level to another. Micro-controller 220A is coupled to MC 110, PR 230A, the common share bus 250, and CC 410A. PR 230A is further coupled to MOSFET 240A. PR 230A, which is also known as a super diode, is a circuit that includes an operational amplifier in order to have the circuit behave like an ideal diode and rectifier. CC 410A is coupled to a common hardware bus 420 and a first resistor 524A is coupled between CC 410A and ground. First resistor 524A is external to PSU 402A.

[0043] PSU 402B includes a converter 210B, micro-controller 220B, precision rectifier (PR) 230B, metal oxide semiconductor field effect transistor (MOSFET) 240B and CC 410B. The output of MOSFET 240B is coupled to the common share bus 250. Micro-controller 220B is coupled to MC 110, PR 230B, the common share bus 250, and CC 410B. PR 230B is further coupled to MOSFET 240B. CC 410B is coupled to a common hardware bus 420 and a second resistor 524B is coupled between CC 410B and ground. Second resistor 524B is external to PSU 402B.

[0044] PSU 402C includes a converter 210C, micro-controller 220C, precision rectifier (PR) 230C, metal oxide semiconductor field effect transistor (MOSFET) 240C and CC 410C. The output of MOSFET 240C is coupled to the common share bus 250. Micro-controller 220C is coupled to MC 110, PR 230C, the common share bus 250, and CC 410C. PR 230C is further coupled to MOSFET 240C. CC 410C is coupled to a common hardware bus 420 and a third resistor 524C is coupled between CC 410C and ground. Third resistor 524C is external to PSU 402C.

[0045] The output of each of the MOSFETs 240A-C is coupled to the common share bus 250. The voltage level on the common share bus is proportional to the output current being provided by the "Master" PSU, by which all "Slave" PSUs will compensate their output current in a manner to match the common share bus value. Micro-controllers 220A-C can read the voltage on the common share bus 250 and trigger converters 210A-C to adjust the output current level according to the magnitude of the common share bus voltage. In one embodiment, one of the PSUs can be designated a "Master" and the other PSUs can be designated as a "Slave". The master PSU determines the voltage on the common share bus 250 which is proportional to the "Mas-